

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Sample holder for application in MALDI mass spectrometry, ~~comprising~~ consisting essentially of:
 - a substrate
 - a porous film present on the substrate and comprising metal oxide particles.
2. (Original) Sample holder according to Claim 1, characterised in that the metal oxide particles are selected from the group including titanium dioxide, zirconium dioxide, niobium oxide, aluminium titanium oxide, tungsten zirconium oxide, hafnium dioxides, tungsten oxide, tin dioxide, lead oxide, lead dioxide, germanium dioxide and gallium oxide (TiO₂, ZrO₂, NbO, Al₂TiO₅, W₂ZrO₈, TiZrO₄, HfO₂, WO₃, SnO₂, PbO, PbO₂, GeO₂ and Ga₂O₃).
3. (Previously Presented) Sample holder according to Claim 1, characterised in that the film has a mean pore size of < 50 nm.

4. (Original) Sample holder according to Claim 3, characterised in that the film has a mean pore size in the range from 1 nm to 25 nm.
5. (Original) Sample holder according to Claim 4, characterised in that the film has a mean pore size in the range from 1 nm to 10 nm.
6. (Previously Presented) Sample holder according to Claim 1, characterised in that the film has a thickness in the range from 0.1 μm to 10 μm .
7. (Previously Presented) Sample holder according to Claim 6, characterised in that the film has a thickness in the range from 2 to 4 μm .
8. (Currently Amended) Sample holder according to Claim ~~7~~ 1, characterised in that the film has a thickness of roughly 3 μm .
9. (Previously Presented) Sample holder according to Claim 1, characterised in that the substrate consists of glass or coated glass.
10. (Original) Sample holder according to Claim 9, characterised in that the glass is a conductive glass or a glass with a conductive coating.
11. (Previously Presented) Sample holder according to Claim 9, characterised in that the substrate consists of glass coated with indium tin oxide (ITO).
12. (Currently Amended) A sample ~~Sample holder according to Claim 1,~~
~~characterised in that the porous film applied on the substrate moreover comprises for~~
MALDI mass spectrometry, comprising:

a. sample holder consisting essentially of

a substrate, and

a porous film present on the substrate and comprising metal oxide particles, and

b. a MALDI matrix overlying the porous film.

13. (Original) Sample holder according to Claim 12, characterised in that the MALDI matrix comprises a substance selected from the group: 2,5-dihydroxy benzoic acid, 3,5-dimethoxy-4-hydroxy cinnamic acid, a-cyano-4-hydroxy cinnamic acid, ferulic acid, 2,4,6-trihydroxy acetophenone.

14. (Previously Presented) Sample holder according to Claim 1, characterised in that the film applied on the substrate is present only at defined areas specifically envisaged to this end, covering same, whereas other ranges therebetween are left free of the film.

15. (Previously Presented) Sample holder according to Claim 1, furthermore comprising: one or several samples to be analysed, which are applied on the film and which is or are presumed to contain one or several substances of interest.

16. (Original) Sample holder according to Claim 15, characterised in that said one or several sample(s) contain(s) substances selected from the group including nucleic acids and proteins.

17. (Currently Amended) Sample holder according to Claim 16, characterised in that the proteins are phosphorylated and/or sulphated.

18. (Currently Amended) Method of selective detection of phosphorylated/sulphated biopolymers, ~~specifically peptides/proteins from peptide/protein mixtures~~, comprising the following steps of operation:

- providing a sample holder according to ~~the present invention~~ claim 1,
- providing a sample which is presumed to contain phosphorylated/sulphated biopolymers, ~~specifically peptides/proteins~~, alone or in combination with other biopolymers, ~~specifically peptides/proteins~~, and applying the sample on the sample holder,
- performing MALDI mass spectrometry.

19. (Currently Amended) Method of preparing a sample holder for application in MALDI mass spectrometry, with the sample holder comprising a substrate and a porous film applied on the substrate and including metal oxide particle, which method comprises the following steps of operation:

- preparing a sol from a metal oxide,
- inducing gel formation, for example by restriction and/or thermal treatment,
- applying the gel on a substrate,
- drying and subsequent tempering at 200 — 600 °C, ~~preferably 300 to 450 °C, most preferably at roughly 400 °C~~, for a period of 30 minutes to 180 minutes, ~~preferably 30 minutes to 60 minutes, most preferably for roughly 45 minutes~~.

20. (Original) Method according to Claim 19, characterised in that the metal oxide is selected from the group including titanium dioxide, zirconium dioxide, niobium oxide, aluminium titanium oxide, tungsten zirconium oxide, hafnium dioxides, tungsten oxide, tin dioxide, lead oxide, lead dioxide, germanium dioxide and gallium oxide

(TiO₂, ZrO₂, NbO, Al₂TiO₅, W₂ZrO₈, TiZrO₄, HfO₂, WO₃, SnO₂, PbO, PbO₂, GeO₂ and Ga₂O₃).

21. (Previously Presented) Method according to Claim 19, characterised in that the film has a mean pore size of < 50 nm.

22. (Original) Method according to Claim 21, characterised in that the film has a mean pore size in the range from 1 nm to 25 nm.

23. (Original) Method according to Claim 22, characterised in that the film has a mean pore size in the range from 1 nm to 10 nm.

24. (Currently Amended) Sample holder ~~suitable for preparation~~ prepared according to a the method ~~according to~~ of Claim 19.

25. (Currently Amended) Sample holder according to Claim 24, comprising a porous film of metal oxide particles, with the film having a mean pore size of < 50 nm, ~~preferably in the range from 1 to 25 nm, most preferably in the range from 1 nm to 10 nm.~~

26. (Currently Amended) Application of a sample holder according to Claim 1, for selective detection of phosphorylated/sulphated biopolymers, ~~specifically peptides/proteins.~~

27. (Original) Application according to Claim 26, with detection being performed by means of MALDI mass spectrometry.

28. (Currently Amended) Method of preparing a sample for MALDI mass spectrometry, using a sample holder according to Claim 1, with the method comprising the following steps of operation:

- Providing a sample holder according to Claim 1,
- Applying a sample ~~on the metal oxide film of the sample holder~~, which is presumed to contain phosphorylated/sulphated biopolymers, ~~specifically peptides/proteins,~~ on the metal oxide film of the sample holder, thereafter
- Washing the metal oxide film in one or several washing operations, thereafter
- Applying a phosphate-containing medium onto the metal oxide film of the sample holder, and thereafter
- applying a MALDI matrix onto the metal oxide film of the sample holder.

29. (Canceled)

30. (Currently Amended) Method of preparing a sample for MALDI mass spectrometry, using a sample holder according to Claim 24, with the method comprising the following steps of operation:

- Providing a sample holder according to Claim 24,
- Applying a sample ~~on the metal oxide film of the sample holder~~, which is presumed to contain phosphorylated/sulphated biopolymers, ~~specifically peptides/proteins,~~ on the metal oxide film of the sample holder, thereafter
- Washing the metal oxide film in one or several washing operations, thereafter
- Applying a phosphate-containing medium onto the metal oxide film of the sample holder, and thereafter

- applying a MALDI matrix onto the metal oxide film of the sample holder.

31. (New) Sample holder according to Claim 16, characterised in that the proteins are phosphorylated and sulphated.

32. (New) Method of selective detection of peptides/proteins from peptide/protein mixtures, comprising the following steps of operation:

- providing a sample holder according claim 1,
- providing a sample which is presumed to contain peptides/proteins, alone or in combination with other peptides/proteins, and applying the sample on the sample holder,
- performing MALDI mass spectrometry.

33. (New) The method according to claim 19, wherein the step of drying and subsequent tempering of the gel substrate is at 200 — 600 °C, for a period of 30 minutes to 60 minutes.

34. (New) The method according to claim 19, wherein the step of drying and subsequent tempering of the gel substrate is at 200 — 600 °C, for a period of about 45 minutes.

35. (New) The method according to claim 19, wherein the step of drying and subsequent tempering of the gel substrate is at 300 to 450°C, for a period of 30 minutes to 180 minutes.

36. (New) The method according to claim 19, wherein the step of drying and subsequent tempering of the gel substrate is at 300 to 450°C, for a period of 30 minutes to 60 minutes.

37. (New) The method according to claim 19, wherein the step of drying and subsequent tempering of the gel substrate is at 300 to 450°C, for a period of about 45 minutes.

38. (New) The method according to claim 19, wherein the step of drying and subsequent tempering of the gel substrate is at roughly 400°C, for a period of 30 minutes to 180 minutes.

39. (New) The method according to claim 19, wherein the step of drying and subsequent tempering of the gel substrate is at roughly 400°C, for a period of 30 minutes to 60 minutes.

40. (New) The method according to claim 19, wherein the step of drying and subsequent tempering of the gel substrate is at roughly 400°C, for a period of about 45 minutes.

41. (New) Application of a sample holder according to Claim 1, for selective detection of phosphorylated/sulphated peptides/proteins.

42. (New) Method of preparing a sample for MALDI mass spectrometry with the method comprising the following steps of operation:

- Providing a sample holder according to Claim 1,
- Applying a sample, which is presumed to contain phosphorylated/sulphated biopolymers, specifically peptides/proteins, on the metal oxide film of the sample holder, thereafter
- Washing the metal oxide film in one or several washing operations, thereafter
- Applying a phosphate-containing medium onto the metal oxide film of the sample holder, and thereafter
- applying a MALDI matrix onto the metal oxide film of the sample holder.

43. (New) Method of preparing a sample for MALDI mass spectrometry with the method comprising the following steps of operation:

- Providing a sample holder according to Claim 24,
- Applying a sample on the metal oxide film of the sample holder, which is presumed to contain phosphorylated/sulphated peptides/proteins, on the metal oxide film of the sample holder, thereafter
- Washing the metal oxide film in one or several washing operations, thereafter

- Applying a phosphate-containing medium onto the metal oxide film of the sample holder, and thereafter
- applying a MALDI matrix onto the metal oxide film of the sample holder.